

CLAIMS

1. A fixing apparatus comprising:

5 a magnetic flux generation section that generates magnetic flux;

a heat-producing element made of a nonmagnetic electrical conductor, that allows passage of the magnetic flux and is induction-heated;

10 at least one magnetism masking element that masks the magnetic flux; and

a magnetic flux adjustment section that switches between masking and clearing of magnetic flux with respect to a paper non-passage area of said heat-producing element,

15 wherein said magnetism masking element is located on the opposite side of said heat-producing element from said magnetic flux generation section.

2. The fixing apparatus according to claim 1,
20 comprising an opposed core located on the opposite side of said heat-producing element from said magnetic flux generation section,

25 wherein said magnetism masking element moves relative to said magnetic flux generation section in a direction of movement of said heat-producing element, and is displaced between a magnetic path blocking position at which a magnetic path

corresponding to a paper non-passage area of said heat-producing element between said magnetic flux generation section and the opposed core is blocked, and a magnetic path clearing position at which the 5 magnetic path is cleared.

3. The fixing apparatus according to claim 1, wherein:

10 said heat-producing element is formed in a circular shape; and

said magnetism masking element is located inside said heat-producing element; and

said magnetic flux generation section is located outside said heat-producing element.

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4. The fixing apparatus according to claim 1, wherein:

said magnetic flux generation section comprises:

20 an exciting coil that is wound and placed; and

a center core located in a center of windings of the exciting coil; and

25 a width of said magnetism masking element in a direction of movement relative to said magnetic flux generation section is greater than a width of the center core in the same direction.

5. The fixing apparatus according to claim 4,
wherein the width of said magnetism masking element
in a direction of movement relative to the magnetic
5 flux generation section is narrower than a winding
width of a winding section of the exciting coil in
the same direction.

6. The fixing apparatus according to claim 5,
10 wherein at least one magnetic path clearing position
of said magnetism masking element is a position at
which said magnetism masking element is opposite the
winding section of the exciting coil.

15 7. The fixing apparatus according to claim 4,
wherein a magnetic path blocking position at which
a magnetic path of a paper non-passage area of said
heat-producing element is blocked by said magnetism
masking element is a position at which said
20 magnetism masking element is opposite the center of
the windings of the exciting coil.

8. The fixing apparatus according to claim 1,
wherein:

25 said magnetic flux generation section
comprises an exciting coil that is wound and placed;
and

a width of said magnetism masking element in a direction of movement relative to said magnetic flux generation section is greater than a width of a center of windings of the exciting coil in the same 5 direction.

9. The fixing apparatus according to claim 8, wherein the width of said magnetism masking element in a direction of movement relative to said magnetic 10 flux generation section is narrower than a winding width of a winding section of the exciting coil in the same direction.

10. The fixing apparatus according to claim 9, 15 wherein at least one magnetic path clearing position of said magnetism masking element is a position at which said magnetism masking element is opposite the winding section of the exciting coil.

20 11. The fixing apparatus according to claim 8, wherein a magnetic path blocking position at which a magnetic path of a paper non-passage area of said 25 heat-producing element is blocked by said magnetism masking element is a position at which said magnetism masking element is opposite the center of the windings of the exciting coil.

12. The fixing apparatus according to claim 1,
comprising a plurality of said magnetism masking
elements having lengths corresponding to each of a
plurality of paper non-passage areas of mutually
5 different widths of said heat-producing element.

13. The fixing apparatus according to claim 12,
wherein:

the plurality of said magnetism masking
10 element are provided on a rotating element that
rotates freely relative to said magnetic flux
generation section; and

an angle forming a normal line passing through
centers of two mutually adjacent magnetism masking
15 elements is set to an angle of either 30
degrees<θ3<60 degrees or 120 degrees<θ4<180
degrees.

14. The fixing apparatus according to claim 1,
20 further comprising an opposed core located opposite
said magnetic flux generation section,

wherein said magnetism masking element is
provided on the opposed core that is rotatable
relative to said magnetic flux generation section.

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15. The fixing apparatus according to claim 2,
wherein said magnetism masking element is formed by

a cutaway part provided in the opposed core.

16. The fixing apparatus according to claim 2,
wherein said magnetism masking element is formed by
5 a recess provided in the opposed core.

17. The fixing apparatus according to claim 15,
wherein an electrical conductor is embedded in the
cutaway part.

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18. The fixing apparatus according to claim 17,
wherein the electrical conductor forms a same plane
with a surface of the opposed core.

15 19. The fixing apparatus according to claim 13,
wherein an electrical conductor is embedded in the
recess.

20. The fixing apparatus according to claim 19,
20 wherein the electrical conductor is formed flush
with a surface of the opposed core.

21. The fixing apparatus according to claim 1,
wherein the plurality of said magnetism masking
25 elements have lengths corresponding to each of A3
size width, A4 size width, and B4 size width paper
non-passage areas of said heat-producing element.

22. The fixing apparatus according to claim 1,
comprising a paper passage area magnetism masking
element having a length corresponding to a paper
5 passage area width smaller than a width of a maximum
paper passage area of said heat-producing element,

wherein the paper passage area magnetism
masking element is placed in a position
corresponding to a paper passage area of said
10 heat-producing element.

23. The fixing apparatus according to claim 1,
wherein:

15 said heat-producing element is configured with
an endless belt; and

a belt supporting member on which the endless
belt is suspended is configured with a member that
allows passage of magnetic flux.

20 24. The fixing apparatus according to claim 23,
wherein the belt supporting member is made of a
metallic material with a thickness in a range of 0.04
mm to 0.2 mm in a vertical direction with respect
to a peripheral surface of the endless belt.

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25. The fixing apparatus according to claim 23,
wherein the belt supporting member has a specific

resistance of 50 $\mu\Omega\text{cm}$ or more.

26. The fixing apparatus according to claim 23, wherein the belt supporting member is made of a
5 nonmagnetic stainless material.

27. The fixing apparatus according to claim 23, wherein the belt supporting member comprises a rotatable supporting roller in which a sheet is
10 formed into a cylindrical shape and a joint is welded.

28. The fixing apparatus according to claim 23, wherein the belt supporting member comprises a
15 rotatable supporting roller in which rib-shaped reinforcing grooves are formed in a direction of a generating line of a cylinder.

29. The fixing apparatus according to claim 23,
20 wherein a circumference of the endless belt is a non-integral multiple of an outer circumference of the supporting roller.

30. The fixing apparatus according to claim 23,
25 wherein the belt supporting member comprises a rotatable supporting roller in which knurl-shaped projections and depressions are formed on an outer

surface of a cylinder.

31. The fixing apparatus according to claim 30, wherein:

5 the projections and depressions are formed with a predetermined pitch in a circumferential direction of the supporting roller; and

10 a circumference of the endless belt is a non-integral multiple of a pitch of the projections and depressions.

32. The fixing apparatus according to claim 23, wherein the belt supporting member is formed with a supporting roller in which a plurality of 15 channel-shaped sheets are combined into a cylindrical shape.

33. The fixing apparatus according to claim 23, wherein the belt supporting member is formed with 20 a guide member in which a sheet is formed into an arc shape.

34. An image forming apparatus comprising the fixing apparatus according to claim 1.

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35. The fixing apparatus according to claim 1, wherein said heat-producing element is made of thin

copper material.

36. The fixing apparatus according to claim 1,
wherein said magnetism masking element is made of
5 an electrical conductor.

37. The fixing apparatus according to claim 1,
wherein said magnetism masking element is made of
copper material.

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38. The fixing apparatus according to claim 1,
wherein said magnetism masking element is made of
aluminum material.